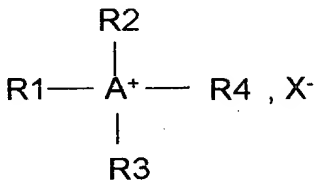
What is claimed is :

1. A compound of the general formula (I) below :

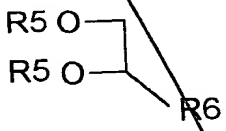
(I)



Wherein A is a phosphorus or an arsenic atom; X^- is an anion; and wherein R1 is selected from the group consisting of :

a) the radical of formula (II) below :

(II)

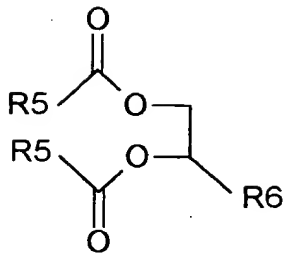


wherein R5 represents a lipid moiety and R6 is a linear or branched alkyl chain from 1 to 4 carbon atoms,

Provided that R2, R3 and R4 of formula (I) represent each a methyl group;

b) the radical of formula (III) below :

(III)

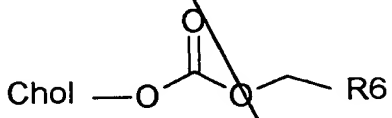


wherein R5 represents a lipid moiety and R6 is a linear or branched alkyl chain from 1 to 4 carbon atoms,

provided that R2, R3 and R4 of formula (I) represent each a methyl group;

c) the radical of formula (IV) below :

(IV)

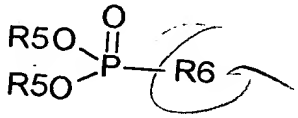


wherein Chol means a cholesteryl radical and R6 is a linear or branched alkyl chain from 1 to 4 carbon atoms,

provided that R2 and R3 of formula (I) represent each a methyl group; and

d) the radical of formula (V) below :

(V)



wherein R5 represents a lipid moiety and R6 is a linear or branched alkyl chain from 1 to 4 carbon atoms,

provided that R2 and R4 are alkyl chains from 1 to 4 carbon atoms; and R3 is selected from the group consisting of:

- an alkyl chain as defined for R2 and R4,
- the functional group CH_2-CH_2-P^+(R6R7R8), wherein R6, R7 and R8 have the same meaning as R2 and R4; and
- CH_2-CO_2R9, wherein R9 has the same meaning as R2.

2. The compound of claim 1, wherein the anion X is selected from the group consisting of an halide, $CF_3SO_3^-$, $CF_3CO_2^-$ or HSO_4^-.

3. The compound of claim 2, wherein the halide is selected from the group consisting of Cl^-, Br^- and I^-.

4. The compound of claim 1, wherein the R5 lipid moiety is selected from the group consisting of :

(i) an alkyl or an alkenyl chain containing from 10 to 22 carbon atoms comprising 0, 1 or 2 olefinic double bonds,

(ii) a cholesteryl derivative

(iii) a perfluoro alkyl chain from 10 to 22 carbon atoms.

5. The compound of claim 1, wherein the R5 lipid moiety is selected from the group consisting of $C_{14:0}$, $C_{18:1}$, $C_{18:2}$; $C_{15:0}$, $C_{17:0}$, $C_{17:1}$, $C_{17:2}$, wherein the first number designates the number of carbon atoms and the second number designates the number of double bonds.

6 The compound of claim 1, wherein R1 is of formula V and R2 and R4 represent each independently a radical selected from the group

consisting of CH_3, C_2H_5, nC_3H_7, iso-C_3H_7, with n being an integer equal to 1, 2 or 3

7. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an alkyl chain and R6 is a methyl group.

8. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an alkenyl chain and R6 is a methyl group.

9. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an alkyl chain and R6 is an ethyl group.

10. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an alkenyl chain and R6 is an ethyl group.

11. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an alkyl chain and R6 is a propyl group

12. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an alkenyl chain and R6 is a propyl group

13. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of a cholesteryl -[C(O)N-CH_2-CH_2-O)] group and R6 is an ethyl group.

14. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of a perfluoroalkyl chain R6 is an ethyl group.

15. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an oleoyl chain ($C_{17}H_{33}C(O)O$) and R6 is a propylen group.

16. A compound according to claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of an oleyl chain ($C_{18}H_{35}$) and R6 is a –1,2 deoxyglycerol group.

17. The compound of claim 1 wherein R1 has the formula (II), (III) or (V), the R5 lipid moiety consists of a cholesteryl group and R6 is a [C(O)O-CH_2-CH_2-] group.

18. A vesicle comprising the compound according to Claim 1 ~~any one of claims 1 to 17.~~

19. A vesicle consisting essentially of a compound according to any one of claims 1 to 17.

20. The vesicle of claim 18, which is a small unilamellar vesicle.

21. The vesicle of claim 18, which is a multilamellar vesicle.

22. A method for introducing *in vitro* a nucleic acid in a cell host comprising the steps of:

a) incubating said nucleic acid with a compound according to Claim 1 ~~any one of claims 1 to 17~~ to obtain complexes formed between said nucleic acid and said compound; and

b) incubating the cell host with the complexes obtained at step a).

23. The method of claim 22, wherein the compound is under the form of unilamellar vesicles.

24. A method for introducing in vivo a nucleic acid in cells of an host organism comprising the steps of :

a) incubating said nucleic acid with a compound according to ~~any one of claims 1 to 17~~ claim 1 to obtain complexes formed between said nucleic acid and said compound; and

b) administering the complexes obtained at step a) to said host organism.

25. The method of claim 24, wherein the organism is a mammal.

26. A complex formed between a nucleic acid and a compound according to any one of claims 1 to 17.

27. The complex of claim 26, wherein the nucleic acid comprises a polynucleotide encoding a polypeptide.

28. The complex of claim 26, wherein the nucleic acid comprises a polynucleotide which encodes an antisense polynucleotide.

29. The complex of claim 26, wherein the polynucleotide encoding a polypeptide is operably linked to a regulatory sequence.

30. A composition comprising a complex according to ~~any one of claims 26 to 29~~ claim 26.

31. A pharmaceutical composition comprising a complex according to any one of claims 26 to 29.